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These experiments have made it possible to propose semiliquid media for obtaining and preserving fully potent cultures of causative agents, and, particularly, for preparing effective killed vaccines and serums (of swine erysipelas, braxy in sheep, paratyphoid of pigeons).

Furthermore, Professor Muromtsev holds that vaccines killed with formalin are preferable to live vaccines because their use in inoculations eliminates the possibility of the spread of infection in the external environment. Prof Muromtsev was awarded the Stalin Prize for his work.

Of considerable interest is the work of Orlov, Senior Scientific Associate, and of the commission on testing the persistence of type properties in Br. bovis, ovis and suis, and strain No 19. Vishnevskiy, Svintsov, and Zotov are members of this commission. It has been shown that the method of typing brucellosis suggested by the English scientist Huddleson, cannot be used fully for establishing the indicated types since on passing (reseeded) of brucellae through nutritional media, their growth properties (biochemical characteristics) are changed.

All standard strains of Type Br. bovis and Type suis preserved at VIEV changed their properties; they did not give off H_2S , and, with a few exceptions, began to grow on thionin. The Br. suis cultures began to grow on fuchsin, did not give off H_2S , and behaved like Br. melitensis. Changes in growth properties were noted also in strain No 19.

These experiments point out the need for using special care in typing brucellosis by Huddleson's method and in the preparation of live vaccines from the strains Br. suis and No 19, i.e., two strains which it might seem have already been sufficiently studied both in the USSR and abroad.

Polyvalent serums and vaccines are being used in medicine and veterinary medicine. Their rational preparation is impossible without studying the antagonism and synergism of microbes and antigens.

Professor Svintsov's experiments on this problem showed that the so-called antagonism between antigens does not exist. Svintsov conducted experiments on laboratory animals and obtained the following polyvalent serums: (a) from swine, serums against plague, paratyphoid, hemosepticemia, and swine erysipelas; (b) from sheep, serums against paratyphoid, colibacillosis, haemorrhagic septocemia, diplococcus infections of calves, and dysentery; and (c) from sheep [sic] serums against dysentery of lambs, haemorrhagic septicemia, and paratyphoid abortion of sheep. These serums met the standards required for their approval.

This principle served as the basis for the preparation of polyvalent biological preparations at VIEV and in other institutions.

In addition to the problem of mutual antigen antagonism, VIEV, in the course of many years, carried out work on the mutual antagonism of causative agents of diseases.

Antagonism between microbes has been studied quite fully during the past 50 years. However, little attention has been given to the problem of antagonism between ultraviruses and microbes and also ultraviruses and protozoa.

Antagonism between the INAN (infectious anemia) virus and hemosporidia, chiefly *N. equi*, was first noted by Professor Markov under farm conditions and later was studied under experimental conditions by Gambarov, Kazanskiy, Poddubskiy, and Markov.

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The peculiarity of the parasitic reaction in the case of illness combined with the carrying of *N. equi* was established.

Data obtained were used as a basis for the differential diagnosis of infectious anemia and hemosporidia of horses and proved to be of considerable value in practice.

During the past 2 years, the division of infectious anemia of horses (Poddubskiy) began the study of the symbiosis of the INAN virus with microbes. Preliminary data have shown the possibility of absorption of the INAN virus on certain microbes (allotriopharial), and the use of this phenomenon for finding methods of specific diagnosis and prophylaxis.

VIEV has given considerable attention to the cultivation (adaptation) of ultraviruses on chicken embryos.

Notwithstanding the opinion of foreign scientists (Govit and others) that the virus of Russian equine infectious encephalomyelitis cannot be adopted to chicken embryos, TSIEM (Central Institute of Experimental Medicine), and senior scientific associates of VIEV and the Tashkir VOS (Veterinary Experimental Station), namely, Ishukov, Zotov, and Polykovskiy obtained positive results. In the course of this work Polykovskiy carried out 40 passages in which the activity of the virus was increased.

Polykovskiy also was successful in the adaptation of the virus of atypical plague of chickens to chicken embryos.

On the basis of results obtained, VIEV proceeded to develop specific prophylactic methods and prepared two vaccines, one against equine infectious encephalomyelitis and the other against atypical plague of birds.

Experiments also were conducted on the adsorption of viruses. Poddubskiy, Doctor of Veterinary Sciences, and Ratner, Senior Scientific Associate, used aluminum hydroxide (prepared by precipitation) in successfully absorbing the INAN viruses and of foot and mouth disease. Subsequently, the adsorbed virus was used for preparing a vaccine against foot and mouth disease which is being used in extensive experiments (Ratner).

The biochemical division, VIEV, has done much work on the isolation and study of fractions from microbe bodies, and the isolation of pure viruses. Professor Tsuverkalov, together with Yuranov and Fishbeyn, studied the allergy and antigen properties of the fraction *B. abortus bovis*. Treating the culture with acetone, ether, and alcohol, they separated the microbe cell into chemically distinct fractions. The protein fraction possessed a clearly expressed allergenic capacity; this property was absent in the hydrolysate of *B. abortus bovis* which was prepared according to a special method.

Krasov, Senior Scientific Associate continued the experiments of Professor Tsuverkalov and obtained six fractions in the hydrolysis of a bacterial mass, of which the fifth and sixth exhibited characteristics of histon and globulin and possessed exclusively allergenic properties in contrast with other fractions which had antigenic properties.

Extensive experiments on the study of the antigenic structure of brucellae in relation to *B. abortus equi* also were conducted by Tashmukhametov and Shaburov, Senior Scientific Associates, and Aspirant Smolyakovaya. They obtained polysaccharide-lipoidal complexes according to Bauven, and made a detailed study of their chemical composition and antigenic and immunogenic properties.

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During these experiments, Kravtsov prepared and recommended for practical use a new, chemically pure preparation for allergy diagnosis of brucellosis called "brucellinhydrolysate"

Kucherenko, Senior Scientific Associate, worked out a method for isolating and purifying virulent material from formative elements of blood of swine afflicted with plague. The isolated virus proved to be highly virulent. It was free of toxic and hemolytic properties, but capable of causing illness in susceptible animals (swine), accompanied by the appearance of specific antibodies. The purified virus also was used successfully to immunize several head of cattle and to obtain from them a specific serum against plague of swine. This work has not been completed

In recent years Boshyan, Candidate of Veterinary Sciences, worked on the problem of obtaining a pure virus INAN and using it for diagnosis and immunization

Of interest is the isolation of toxins from causative agents of protozoic diseases of animals. Professor Kitanakki prepared trypanotoxin from the causative agents of the coupling disease and su-auru. This toxin, upon injection into small animals, produced clinical symptoms of trypanosomiasis. On the recommendation of Professor Kazenskiy, trypanotoxin was used by Bazdyrev of the Stavropol' VOS. When this toxin was injected into the neck of a horse, the characteristic spots appeared in the croup region and large amounts of complement-binding substances were detected in the blood serum. Through trypanotoxin it was possible to determine the pathogenesis of the appearance of spots, and to obtain, in laboratory conditions, a highly active serum for carrying out the RSK reaction for trypanosome. The newly introduced RSK method of diagnosis is being used in practice

The role of the macroorganism's state in infectious diseases was studied by many divisions of VIEV

In this field of study, mention should be made of I. D. Nikolayevskiy's work, in which he considered the complexity and peculiar characteristics of the tundra, and also the varied physiological changes which occur in the organism of reindeer during different seasons of the year. It has been established that the life functions of reindeer change in the summer and winter periods (phase of extinguishment in the winter and phase of recovery in the summer). Results obtained were used as the basis for the selection of the time for anthrax inoculations and also for combating necrobacillosis.

The role of the state of the macroorganism in the case of abortions of horses and infectious anemia was studied by Poddutskiy and Alikayev, Candidate of Veterinary Sciences. They showed that rich mineral and vitamin feeding (especially group B vitamins) sharply increases the resistance of the organism of horses to both infectious anemia and the development of a pathological process connected with the disease. Results obtained made it possible to explain the peculiarity of the course of infections at various farms, and also to recommend an appropriate preparation of colts for obtaining clearer results in carrying out biological tests for infectious anemia.

The significance of full-valued mineral and vitamin nutrition was further substantiated by the authors in the case of alimentary and infectious abortions in horses and particularly abortions caused by paratyphoid. On the basis of experimental work which was conducted, full-valued feeding was recommended as a method for preventing abortions.

Professor Terent'yev and Stefanov, Candidate of Veterinary Sciences, while studying immunity in the case of anthrax, established that the post vaccinal, local inflammatory, and general reactions of the organism are of decisive importance in the production of immunity. The very same antigen, for example,

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Tsenkovskiy's first vaccine, may be of full value in conferring immunity if, at the point of injection a corresponding inflammatory reaction is caused artificially by materials supplementary to the antigen and not of full value, in that it fails to give immunity in the absence of a reaction. On the basis of obtained results there was developed a method of vaccination with a killed culture of anthrax, a procedure which up to that time had not been successful.

This same principle was used by the authors in experiments on the vaccination of small animals against swine erysipelas and brucellosis. Histological studies conducted by Professor Ivanov showed that the degree of inflammatory reaction was different for saponin, agar, and aluminum hydroxide. Experiments are being continued in 1947.

The role of the nervous system in the pathology and therapy of animals was the subject of Radkevich's doctorate dissertation. He conducted his work under the direction of Academician A. D. Speranskiy and used laboratory animals which were infected with tripanosoma (su-auru and Dourine). It was shown that by influencing the nervous system of an animal it is possible to change significantly the development of the pathological process and the action of chemical preparations. This problem has not advanced to a stage where any practical application can be recommended.

Problems dealing with the epizootology of most types of infectious diseases of animals and birds were studied at VIEV. This institute also did work on anthrax (Terent'yev), glanders (Vyshel'skiy), rinderpest (Drachinskiy), paratuberculosis (Vishnevskiy), plague of birds (Svintsov), Aujeszky's Disease (Solomkin), etc.

The protozoological division, VIEV, headed by Professor Markov, conducted important work on the epizootology of protozoal diseases. It was found that in the epizootology of hemosporidia the leading role is played by three factors: (a) infected animals and virus carriers; (b) transmitters; and (c) susceptible animals (invasion triad). Professor Markov recommended an epizootological classification of territories with regard to hemosporidiosis. On the basis of this classification an epizootological characterization of USSR republics and oblasts was made available, and an atlas of the hemosporidiosis situation was compiled. This atlas makes it possible to organize properly measures for controlling hemosporidiosis in the USSR, especially in connection with the driving of cattle for long distances.

Professor Kazanskiy worked out a corresponding territory classification in the case of su-auru of animals. This classification was written into textbooks and instructions of the ministry.

At present, workers of VIEV are further endeavoring to raise their work to the proper theoretical level.

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